UNITED STATES PATENT OFFICE.

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METHOD OF SAVING FLOATING MATERIALS IN ORE-SEPARATION.

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To all whom it may concern:

Be it known that I, HEZEKIAH BRADFORD, of Philadelphia, in the State of Pennsylvania, have invented an Improvement in Methods of Saving Floating Materials in Ore-Separation, of which the following is a specification.

Almost all metallic ores—coal and other substances—when pulverized, contain a greater or less proportion of particles of ore or metal that will, even if pulverized in water, float on the surface of the water, and the finer the substances are pulverized the greater the proportion of floating particles. These floating particles appear to possess some peculiar quality which repels the water from their surfaces, especially when such particles are exposed, even momentarily, to atmospheric air, and when such exposure takes place the water is repelled from a sufficient portion of their surfaces to cause such particles to float off on the surface of the waste water from the other particles that sink in the water.

In concentrating ores they should be pulverized fine enough to liberate the metallic particles and the particles of native metals from their gangue. They are then, or should be, sized with screens. The larger sizes are, or should be, concentrated in jigs. The finer sizes are, or should be, concentrated by concussion-tables similar to the "Rittinger table," or by some of the various vanning-machines.

In amalgamating ores the quicksilver will not act on the base metallic ores; neither will it act on the particles of native metal unless the particles are brought in contact with the quicksilver, and consequently all the particles that float off over the amalgamating-pan are lost.

In the concentration of coal from slate as heretofore practiced a considerable proportion of coal, iron pyrites, and some slate will float off and be lost, and there are many other substances which while being concentrated or washed in water have heretofore floated off and been lost.

In the drawings, Figure 1 is a section representing my improvement as applied to the separator known as the "Rittinger table." Fig. 2 represents the improvement as applied to an ore-separator of the class known as the "Frue vanner." Fig. 3 represents the improvement as adapted to a trough or similar delivery device through which the tailings pass, and Fig. 4 represents the improvement as adapted to the tailings from a jig.

My present invention consists in a method of saving floating materials in ore-separation by passing such floating materials along upon the surface of the water, with but little agitation of the water, thus preventing such materials from subsiding, and then causing the water and floating materials to plunge or fall into a water-receptacle, and retaining said floating materials in said receptacle until they lose their floating power and sink. To accomplish this I attach to the end of the table *b* a metal plate, *b'*, on a level with the table and of the same descent, and fit it so evenly as to cause no ripple in the water as it passes from the table to the plate. This plate is wide enough to catch all the tailings, the waste water, and the floating material as these substances leave the lower end of the table, and catch none of the concentrations, and as the line where the concentrations and tailings meet on the table changes back and forth this plate must be so attached to the end of the table that it can be moved back and forth as this line changes on the table. This plate *b'* must be attached also as nearly parallel as possible with the line of motion of the table.

Under the plate *b'*, and as close to it as possible, I provide a stationary metal plate, *a*, which receives the water, the tailings, and the floating material without ripple, and conveys the same to the top of the water in tank D. This plate *a* is preferably a little more inclined than the plate *b'*, as it has no motion. Both plates should have just descent enough to deliver the substances upon the top of the water in tank D with as little force as possible, and the plate *a* should touch the top of the water, so that the substances will not plunge under the water of the tank D or make any unnecessary ripple; nor should said plate *a* dip under the water, as that would cause an eddy in the current on the top of the water by the discharge of the substances from plates *b'* and *a*, and this eddy, by detaining the floating particles, would cause some of them to sink